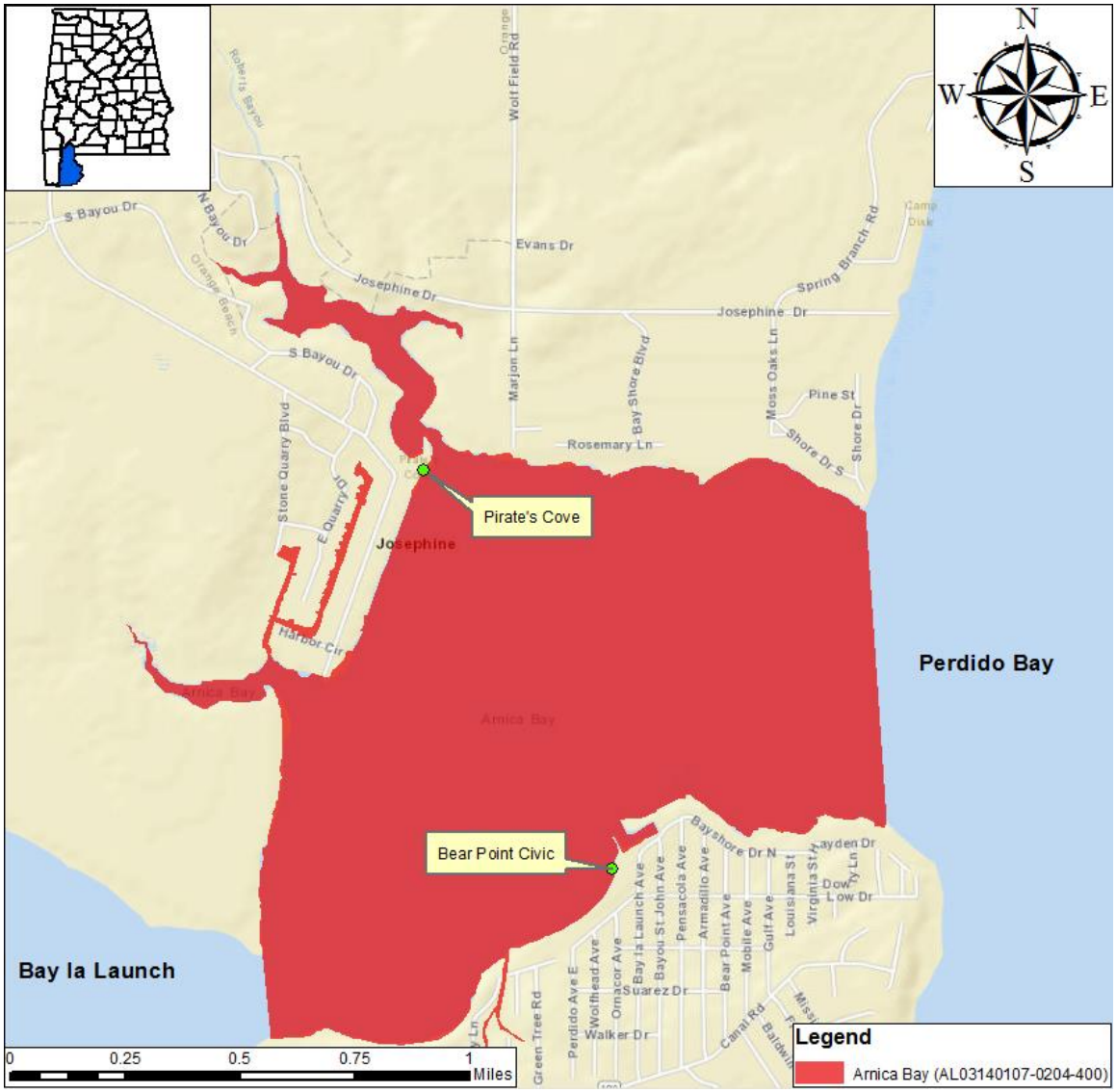
Draft
Delisting Decision
For
Arnica Bay

Assessment Unit ID # AL03140107-0204-400

Pathogens (Enterococcus)

Alabama Department of Environmental Management
Water Quality Branch
Water Division
February 2018

Figure 1: Arnica Bay and Sampling Locations



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1.0 Executive Summary

Arnica Bay, located in Baldwin County, is a part of the Perdido River Basin. Arnica Bay is located between Bay la Launch and Perdido Bay and has an area of 1.27 mi^2. Arnica Bay has use classifications of Swimming and Other Whole Body Water Contact Sports (S), Shellfish Harvesting (SH) and Fish & Wildlife (F&W). The impaired segment addressed in this delisting decision is listed in Table 1.

Arnica Bay was originally placed on the State of Alabama's §303(d) List for pathogens (enterococcus) in 2012 as a result of water quality data collected in 2010 by the Alabama Department of Environmental Management (ADEM) coastal monitoring program. The sources of impairment were listed as on-site wastewater systems. Subsequent data from ADEM's coastal monitoring program have shown no impairment on the listed segment of Arnica Bay with respect to pathogens.

The most recent water quality data available for Arnica Bay was collected from 2011-2016. Data from stations P_COVE and BP_CIV, located on the listed segment (AL03140107-0204-400), show that Arnica Bay is meeting applicable water quality standards with respect to pathogens.

This report addresses the results of the delisting analysis for Arnica Bay. Based on the assessment of all available water quality data, ADEM has determined that Arnica Bay (AL03140107-0204-400) is not impaired due to pathogens and that water quality standards are being attained. Therefore, ADEM will not develop a Total Maximum Daily Load (TMDL) in light of "more recent or accurate data," which is just cause for delisting a waterbody according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv).

Table 1: Arnica Bay Segment from the 2016 §303(d) List

ID	Use	Cause	Date of Data	Size	Downstream/Upstream Locations
AL03140107-0204-400	SH/S/F&W	Pathogens	2010	1.27 square miles	Perdido Bay/Bay la Launch

2.0 Basis for §303(d) Listing

Section 303(d) of the Clean Water Act (CWA), as amended by the Water Quality Act of 1987 and EPA's Water Quality Planning and Management Regulations [Title 40 of the Code of Federal Regulations (CFR), Part 130], requires states to identify waterbodies which are not meeting water quality standards applicable to their designated use classifications. The identified waters are prioritized based on severity of pollution with respect to designated use classifications. TMDLs for all pollutants causing violation of applicable water quality standards are established for each waterbody identified as impaired. Such loads are established at levels necessary to implement the applicable water quality standards with seasonal variations and margins of safety. The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a waterbody, based on the relationship between pollution sources and instream water quality conditions, so that states can establish water quality-based controls to reduce pollution from both

point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991).

Arnica Bay was originally listed on the 2012 §303(d) list for pathogens (enterococcus) based on 2010 data from coastal monitoring station P_COVE. Data at P_COVE showed that 15 out of 65 samples were exceeded during the 2010 coastal monitoring period (23% exceedance rate). The source of pathogens was listed as on-site wastewater systems in the surrounding area. The data utilized for the listing is summarized in Table 5, located in Appendix 6.2.

3.0 Technical Basis for Delisting Decision

3.1 Water Quality Target Identification

The water quality criteria for pathogens are numeric with quantifiable endpoints. State regulations dictate that enterococci counts are to be used as the bacterial indicator for coastal waters. Arnica Bay has use classifications of Swimming and Other Whole Body Water Contact Sports, Shellfish Harvesting, and Fish and Wildlife. Since the Swimming and Other Whole Body Water Contact Sports enterococci values are the most stringent of the applicable criteria (as shown in Table 2), they will be utilized in the evaluation of Arnica Bay. For waters with a Swimming and Other Whole Body Water Contact Sports use classification, bacteria of the enterococci group shall not exceed a maximum of 104 colonies per 100 ml in any sample and shall not exceed a geometric mean of 35 colonies per 100 ml.

Table 2: ADEM Enterococci Criteria

Use Classification	Enterococci Criteria (colonies/100 ml)
Swimming and Other Whole Body Water Contact Sports (S)	January-December (Year-round) • Geometric Mean ≤ 35 • Single Sample Max ≤ 104
Shell Fish Harvesting (SH)	May-October • Geometric Mean ≤ 35 • Single Sample Max ≤ 104 November-April • Single Sample Max ≤ 275
Fish and Wildlife (F&W)	May-October • Geometric Mean ≤ 35 • Single Sample Max ≤ 158 November-April • Single Sample Max ≤ 275

3.2 Data Availability and Analysis

The source of data that was utilized in the evaluation of Arnica Bay is ADEM's coastal beach monitoring program (2011-2016). There are two stations utilized in the delisting analysis, P_COVE and BP_CIV, which are both on the impaired segment of Arnica Bay. Descriptions of the stations and corresponding coordinates are listed in Table 3.

In accordance with ADEM's 2016 Water Quality Assessment and Listing Methodology, in order to delist a waterbody, 10% or less of enterococcus single samples must be less than or equal to 104 colonies per 100 ml (as determined by the binomial distribution function). For each station on Arnica Bay, the number of single sample exceedances was less than the allowable number of exceedances. Also, P_COVE and BP_CIV did not have any geometric mean exceedances. Table 4 provides a summary of the enterococci data for the impaired portion of Arnica Bay. Based on the enterococci data, ADEM does not consider this segment of Arnica Bay to be impaired due to pathogens. The complete data set used in this delisting analysis can be found in Appendix 6.2 (Tables 6-17).

Table 3: ADEM Sampling Stations on listed portion of Arnica Bay

Station Name	Agency Name	Latitude	Longitude	Description
P_COVE	ADEM	30.3214	-87.53378	Beach Monitoring Station-Pirate's Cove
BP_CIV	ADEM	30.3088	-87.5268	Beach Monitoring Station-Bear Point Civic Association

Table 4: Data Summary by Station

Station	Total Geometric Mean Samples	Geometric Mean Criteria (col/100ml)	Geometric Mean Exceedances	Total Single Samples	Single Sample Criteria (col/100 ml)	Single Sample Exceedances	Allowable Single Sample Exceedances
BP_CIV	0	≤35	0	109	≤104	5	7
P_COVE	21	≤35	0	258	≤104	17	20

4.0 Conclusions

From examination of all available water quality data for the impaired portion of Arnica Bay, ADEM has determined that a pathogens (enterococcus) impairment does not currently exist. Therefore, ADEM will not develop a TMDL for this pollutant in light of "more recent data," which is just cause for delisting a waterbody according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv).

5.0 Public Participation

As part of the public participation process, this Delisting Decision (DD) will be placed on public notice and made available for review and comment. A public notice will be prepared and published in the major daily newspapers in Montgomery, Huntsville, Birmingham, and Mobile, as well as submitted to persons who have requested to be on ADEM's postal and electronic mailing

distributions. In addition, the public notice and subject document will be made available on ADEM's Website: www.adem.state.al.us. The public can also request paper or electronic copies of the report by contacting Ms. Kimberly Minton at 334-271-7826 or kminton@adem.alabama.gov. The public will be given an opportunity to review the DD and submit comments to the Department in writing. At the end of the public review period, all written comments received during the public notice period will become part of the administrative record. ADEM will consider all comments received by the public prior to finalization of this DD and subsequent submission to EPA Region 4 for final review and approval.

6.0 Appendices

6.1 References

1. Alabama Department of Environmental Management, 2012, 2014, and 2016 §303(d) List.

2. Alabama's Coastal Beach Monitoring Program. 2010-2016. ADEM.

3. ADEM Administrative Code, 2013. Water Quality Program, Chapter 335-6-10, Water Quality Criteria, and Chapter 335-6-11, Use Classifications for Interstate and Intrastate Waters.

4. United States Environmental Protection Agency. 1991. *Guidance for Water Quality-Based Decisions: The TMDL Process*, Office of Water, EPA 440/4-91-001.

5. Alabama Department of Environmental Management, Water Quality Assessment and Listing Methodology (ADEM 2016).

6. United States Environmental Protection Agency, 1986. Quality Criteria for Water. Office of Water. EPA 440/4-91-001.

6.2 Water Quality Data

Table 5: Listing Data – 2010 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample
1/5/2010	58
2/3/2010	4
3/4/2010	60
4/27/2010	30
4/29/2010	1067
4/30/2010	7
5/3/2010	160
5/4/2010	410
5/5/2010	7
5/10/2010	90
5/12/2010	1330
5/13/2010	7
5/17/2010	14
5/19/2010	2
5/24/2010	20
5/26/2010	18
6/1/2010	7
6/3/2010	7
6/8/2010	2
6/10/2010	400
6/11/2010	20
6/14/2010	6
6/15/2010	2
6/21/2010	108
6/23/2010	1200
6/24/2010	7
6/28/2010	400
6/29/2010	7
6/30/2010	7
7/6/2010	28
7/8/2010	6
7/12/2010	4
7/14/2010	2
7/19/2010	30
7/21/2010	6
7/26/2010	4
7/28/2010	2

Date	Single Sample
8/2/2010	42
8/4/2010	6
8/9/2010	4
8/11/2010	2
8/16/2010	693
8/17/2010	10
8/18/2010	6
8/23/2010	2
8/25/2010	6
8/30/2010	473
8/31/2010	32
9/1/2010	260
9/2/2010	2
9/7/2010	44
9/9/2010	2
9/13/2010	4
9/15/2010	533
9/16/2010	633
9/17/2010	20
9/20/2010	78
9/22/2010	10
9/27/2010	2
9/29/2010	4
10/20/2010	2
11/3/2010	367
11/4/2010	133
11/5/2010	14
12/7/2010	9

Table 6: 2011 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/06/11	2	
11/16/11	8	
10/17/11	2	
09/28/11	18	
09/12/11	40	
08/29/11	12	
08/15/11	< 2	
08/01/11	26	
07/18/11	6	
07/05/11	8	
06/20/11	14	
06/07/11	4	
05/23/11	< 2	
05/09/11	2	
04/26/11	20	
03/01/11	< 2	
02/07/11	< 2	
01/18/11	< 2	

Table 7: 2012 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/04/12	2	
11/06/12	2	
10/02/12	2	
09/17/12	6	
09/05/12 resample	16	
09/04/12	> 400	
08/20/12	10	
08/06/12	10	
07/23/12	4	
07/09/12	< 2	
06/25/12	16	
06/11/12	102	
05/29/12	36	
05/14/12	< 2	
04/30/12	24	
03/06/12	70	
02/08/12	2	
01/10/12	< 2	

Table 8: 2013 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/03/13	< 2	
11/05/13	2	
10/16/13	< 2	
09/17/13 resample	< 2	
09/16/13	144	
09/03/13	14	
08/19/13	32	
08/05/13	12	
07/22/13	8	
07/08/13	34	
06/24/13	6	
05/28/13	4	
05/13/13	44	
04/29/13	18	
03/05/13	4	
02/06/13 resample	48	
02/05/13	340	
01/08/13	< 2	

Table 9: 2014 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/09/14	6	
11/04/14	< 2	
10/07/14	< 2	
09/17/14	22	
09/03/14	26	
08/19/14	2	
08/06/14	2	
07/23/14	4	
07/09/14	16	
06/25/14	70	
06/11/14	6	
05/28/14	2	
05/14/14	14	
05/07/14	36	
03/11/14	< 2	
02/04/14	< 2	
01/14/14	34	

Table 10: 2015 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/02/15	22	
11/03/15	4	
10/06/15	2	
09/30/15	8	
09/16/15	10	
09/02/15	< 2	
08/19/15	7	
08/06/15 resample	2	
08/05/15	360	
07/22/15	2	
07/08/15	42	
06/24/15	16	
06/10/15	< 2	
05/27/15	38	
05/13/15	< 2	
04/29/15	4	
03/03/15	< 2	
02/10/15	7	
01/06/15	7	

Table 11: 2016 Arnica Bay Pathogen Data at BP_CIV

Date	Single Sample Count	Geometric Mean
12/07/16 resample	46	
12/06/16	307	
11/08/16	40	
10/04/16	2	
09/28/16	7	
09/14/16	6	
08/31/16	16	
08/17/16	10	
08/03/16	60	
07/02/16	8	
07/06/16	2	
06/22/16	2	
06/08/16	6	
05/25/16	2	
05/11/16	2	
04/27/16	20	
03/02/16	< 2	
02/02/16	2	
01/05/16	13	

Table 12: 2011 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
12/06/11	10	
11/16/11	22	
10/17/11	< 2	
09/29/11	2	7
09/28/11	4	
09/22/11 resample	48	
09/21/11	133	
09/19/11	6	
09/14/11	4	
09/12/11	6	
09/08/11	2	
09/07/11	2	
08/31/11	2	5
08/29/11	< 2	
08/25/11 resample	4	
08/24/11	> 400	
08/22/11	2	
08/17/11	< 2	
08/15/11	< 2	
08/10/11	4	
08/08/11	26	
08/03/11	2	
08/01/11	< 2	
07/27/11	33	8
07/25/11	4	
07/20/11	< 2	
07/18/11	50	
07/13/11	< 2	
07/11/11	27	
07/07/11	< 2	
07/05/11	14	
06/29/11	2	3
06/27/11	2	
06/22/11	6	
06/20/11	2	
06/15/11	< 2	

Date	Single Sample Count	Geometric Mean
06/13/11	8	
06/09/11	18	
06/07/11	< 2	
06/02/11	< 2	
05/31/11	32	9
05/25/11	6	
05/23/11	18	
05/18/11	< 2	
05/16/11	14	
05/11/11	< 2	
05/09/11	2	
05/04/11	6	
05/02/11	102	
04/28/11	64	
04/26/11	8	
04/20/11	10	
04/18/11	2	
03/02/11	2	
02/08/11	8	
01/19/11	4	

Table 13: 2012 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
01/10/12	50	
02/08/12	112	
02/09/12 resample	52	
03/06/12	2	
04/24/12	< 2	
04/26/12	< 2	
04/30/12	8	
05/02/12	> 400	17
05/03/12 resample	427	
05/04/12 resample	84	
05/07/12	< 2	
05/09/12	50	
05/14/12	12	
05/16/12	12	
05/22/12	< 2	
05/24/12	8	
05/29/12	< 2	
05/31/12	4	
06/05/12	4	32
06/07/12	38	
06/11/12	1260	
06/12/12 resample	14	
06/13/12	14	
06/18/12	58	
06/20/12	22	
06/25/12	46	
06/27/12	16	
07/02/12	76	6
07/05/12	2	
07/09/12	6	
07/11/12	2	
07/16/12	26	
07/18/12	< 2	
07/23/12	2	
07/25/12	2	
07/30/12	22	

Date	Single Sample Count	Geometric Mean
08/01/12	< 2	8
08/06/12	6	
08/08/12	6	
08/13/12	36	
08/15/12	14	
08/20/12	38	
08/22/12	2	
09/04/12	121	11
09/06/12	62	
09/10/12	28	
09/12/12	2	
09/17/12	< 2	
09/19/12	10	
09/24/12	12	
09/26/12	< 2	
10/02/12	13	
11/06/12	54	
12/04/12	4	

Table 14: 2013 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
12/03/13	< 2	
11/05/13	6	
10/16/13	10	
09/25/13	10	15
09/24/13 resample	28	
09/23/13	114	
09/18/13	22	
09/16/13	18	
09/11/13	8	
09/09/13	16	
09/04/13	< 2	
09/03/13	14	
08/28/13	10	17
08/27/13 resample	6	
08/26/13	127	
08/21/13	6	
08/19/13	50	
08/14/13	8	
08/13/13 resample	76	
08/12/13	140	
08/07/13	2	
08/05/13	4	
07/31/13	2	14
07/29/13	38	
07/24/13	12	
07/22/13	22	
07/17/13	8	
07/15/13	8	
07/10/13	4	
07/08/13 resample	10	
07/02/13	220	
07/01/13	20	
06/26/13	14	12
06/24/13	38	
06/19/13	< 2	
06/17/13	78	
06/12/13	< 2	
06/05/13	10	
06/04/13	26	

Date	Single Sample Count	Geometric Mean
05/30/13	8	17
05/28/13	18	
5/23/13 resample	2	
05/22/13	173	
05/20/13	88	
05/14/13	2	
05/13/13	< 2	
05/08/13	4	
05/06/13	10	
05/02/13 resample	88	
05/01/13	467	
04/29/13	56	
04/25/13	18	
04/24/13 resample	10	
04/23/13	280	
03/05/13	20	
02/05/13	24	
01/08/13	2	

Table 15: 2014 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
12/09/14	14	
11/04/14	2	
10/07/14	< 2	
09/24/14	20	
09/17/14	92	
09/09/14	6	
09/03/14	18	
08/27/14	18	
08/19/14	< 2	
08/13/14	< 2	
08/06/14	2	
07/30/14	2	3
07/23/14	< 2	
07/16/14	4	
07/09/14	12	
07/02/14	< 2	
06/26/14 resample	4	21
06/25/14	233	
06/18/14	< 2	
06/11/14	18	
06/05/14 resample	12	
06/04/14	240	
05/28/14	8	
05/21/14	4	
05/14/14	24	
05/07/14	28	
04/23/14	8	
03/11/14	22	
02/04/14	8	
01/14/14	68	

Table 16: 2015 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
12/02/15	4	
11/03/15	12	
10/06/15	4	
09/30/15	6	2
09/23/15	< 2	
09/16/15	< 2	
09/09/15	2	
09/02/15	< 2	
08/26/15	2	
08/19/15	< 2	
08/12/15	4	
08/05/15	14	
07/28/15	8	18
07/22/15	< 2	
07/15/15	4	
07/09/15 resample	20	
07/08/15	567	
07/01/15	50	
06/24/15	6	
06/17/15	4	
06/10/15	6	
06/03/15	6	
05/27/15	36	
05/20/15	4	
05/13/15	< 2	
05/06/15	30	
04/29/15	10	
04/22/15	< 2	
03/03/15	< 2	
02/10/15	< 2	
01/06/15	12	

Table 17: 2016 Arnica Bay Pathogen Data at P_COVE

Date	Single Sample Count	Geometric Mean
12/06/16	102	
11/08/16	24	
10/04/16	2	
09/28/16	6	
09/21/16	< 2	
09/14/16	10	
09/07/16	< 2	
08/31/16	36	4
08/24/16	< 2	
08/17/16	< 2	
08/08/16	< 2	
08/03/16	< 2	
07/27/16	38	
07/20/16	4	
07/13/16	4	
07/06/16	2	
06/29/16	2	5
06/22/16	< 2	
06/15/16	64	
06/08/16	4	
06/01/16	4	
05/25/16	< 2	
05/19/16	4	
05/11/16	8	
05/04/16	8	
04/27/16	6	
04/20/16	7	
03/02/16	4	
02/02/16	12	
01/05/16	14	